

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

TestAmerica Job ID: 480-38147-1
Client Project/Site: Olin Chemical Groundwater Semi-annual
Sampling Event: Groundwater Semi-annual (5,11)

For:
Olin Corporation
PO BOX 248
Charleston, Tennessee 37310-0248

Attn: Mr. James Cashwell

CHECKED FOR COMPLETENESS
OF PARAMETERS ORDERED BY:

Authorized for release by:
5/24/2013 10:07:31 AM
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VTL

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater Semi-annual

TestAmerica Job ID: 480-38147-1

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater Semi-annual

TestAmerica Job ID: 480-38147-1

Job ID: 480-38147-1

Laboratory: TestAmerica Buffalo

Narrative

Job Narrative 480-38147-1

Comments

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

TestAmerica's Reporting Limits (RLs) for this report may not always meet client specified method reporting limits due to various reasons such as methodology, dilutions, matrix or moisture content (soils). TestAmerica's pivot table EDD documents which compound(s) exceed certain regulatory standards. If not included with your deliverables, please contact your Project Manager about the availability of this EDD for your report.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

Receipt

The samples were received on 5/11/2013 6:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.0° C.

Note: All samples that require thermal preservation are considered acceptable if the arrival temperature is within the method's specified temperature range or for general analysis, ranging from 6°C to just above the freezing temperature of water. Samples that are hand delivered, immediately following collection, may not meet these criteria; however, they will be considered acceptable according to NELAC and State standards, if there is evidence that the chilling process has begun, such as stored and transported to the laboratory on ice.

HPLC

Method(s) 300.0: The following samples were diluted to bring the concentration of target analytes within the calibration range: OC-GW-43SR-XXX (480-38147-4). Elevated reporting limits (RLs) are provided.

No other analytical or quality issues were noted.

Metals

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

No other analytical or quality issues were noted.

General Chemistry

No analytical or quality issues were noted.

MassDEP Analytical Protocol Certification Form

Laboratory Name: **TestAmerica Buffalo** Project #: **480-38147**

Project Location: **Olin Chemical GW Semi-Annual** RTN:

This form provides certifications for the following data set: list Laboratory Sample ID Number(s):

38147 [1-4]

Matrices: ☒ Groundwater/Surface Water ☐ Soil/Sediment ☐ Drinking Water ☐ Air ☐ Other:

CAM Protocols (check all that apply below):

8260 VOC CAM II A <input type="checkbox"/>	7470/7471 Hg CAM III B <input type="checkbox"/>	Mass DEP VPH CAM IV A <input type="checkbox"/>	8081 Pesticides CAM V B <input type="checkbox"/>	7196 Hex Cr CAM VI B <input type="checkbox"/>	Mass DEP APH CAM IX A <input type="checkbox"/>
8270 SVOC CAM II B <input type="checkbox"/>	7010 Metals CAM III C <input type="checkbox"/>	Mass DEP EPH CAM IV B <input type="checkbox"/>	8151 Herbicides CAM V C <input type="checkbox"/>	8330 Explosives CAM VIII A <input type="checkbox"/>	TO-15 VOC CAM IX B <input type="checkbox"/>
6010 Metals CAM III A <input checked="" type="checkbox"/>	6020 Metals CAM III D <input type="checkbox"/>	8082 PCB CAM V A <input type="checkbox"/>	9014 Total Cyanide/PAC CAM VI A <input type="checkbox"/>	6860 Perchlorate CAM VIII B <input type="checkbox"/>	

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding time.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
E	a. VPH, EPH and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status


G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No ¹
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Data User Note: Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WCS-07-350

H	Were all QC performance standards specified in the CAM protocol(s) achieved?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No ¹
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s) ?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No ¹

¹ All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.

Signature:  Position: Project Manager
Printed Name: Lisa Shaffer Date: 5/24/13 0:00

Detection Summary

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater Semi-annual

TestAmerica Job ID: 480-38147-1

Client Sample ID: OC-MP-2PORT13-XXX

Lab Sample ID: 480-38147-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	21		5.0	1.0	ug/L	1		6010	Dissolved
Aluminum	120	J	200	60	ug/L	1		6010	Dissolved
Chloride	87		0.50	0.28	mg/L	1		300.0	Total/NA
Sulfate	22		2.0	0.35	mg/L	1		300.0	Total/NA
Ammonia	0.20		0.020	0.0090	mg/L	1		350.1	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	400		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-GW-34D-XXX

Lab Sample ID: 480-38147-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	12		5.0	1.0	ug/L	1		6010	Dissolved
Chloride	12		0.50	0.28	mg/L	1		300.0	Total/NA
Sulfate	35		2.0	0.35	mg/L	1		300.0	Total/NA
Ammonia	14		0.20	0.090	mg/L	10		350.1	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	210		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-GW-34SR-XXX

Lab Sample ID: 480-38147-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	1.9	J	5.0	1.0	ug/L	1		6010	Dissolved
Chloride	2.2		0.50	0.28	mg/L	1		300.0	Total/NA
Sulfate	7.8		2.0	0.35	mg/L	1		300.0	Total/NA
Ammonia	0.15		0.020	0.0090	mg/L	1		350.1	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	64		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

Client Sample ID: OC-GW-43SR-XXX

Lab Sample ID: 480-38147-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	1.6	J	5.0	1.0	ug/L	1		6010	Dissolved
Aluminum	350		200	60	ug/L	1		6010	Dissolved
Chloride	270		2.5	1.4	mg/L	5		300.0	Total/NA
Sulfate	34		2.0	0.35	mg/L	1		300.0	Total/NA
Ammonia	1.8		0.020	0.0090	mg/L	1		350.1	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Specific Conductance	990		1.0	1.0	umhos/cm	1		SM 2510B	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Buffalo

Client Sample Results

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater Semi-annual

TestAmerica Job ID: 480-38147-1

Client Sample ID: OC-MP-2PORT13-XXX

Lab Sample ID: 480-38147-1

Date Collected: 05/09/13 10:10

Matrix: Water

Date Received: 05/11/13 06:00

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	21		5.0	1.0	ug/L		05/13/13 07:45	05/13/13 18:55	1
Aluminum	120	J	200	60	ug/L		05/13/13 07:45	05/13/13 18:55	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	87		0.50	0.28	mg/L			05/14/13 16:44	1
Sulfate	22		2.0	0.35	mg/L			05/14/13 16:44	1
Ammonia	0.20		0.020	0.0090	mg/L			05/13/13 17:00	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	400		1.0	1.0	umhos/cm			05/16/13 02:30	1

Client Sample ID: OC-GW-34D-XXX

Lab Sample ID: 480-38147-2

Date Collected: 05/09/13 12:20

Matrix: Ground Water

Date Received: 05/11/13 06:00

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	12		5.0	1.0	ug/L		05/13/13 07:45	05/13/13 18:57	1
Aluminum	ND		200	60	ug/L		05/13/13 07:45	05/13/13 18:57	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	12		0.50	0.28	mg/L			05/14/13 16:54	1
Sulfate	35		2.0	0.35	mg/L			05/14/13 16:54	1
Ammonia	14		0.20	0.090	mg/L			05/13/13 18:40	10
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	210		1.0	1.0	umhos/cm			05/16/13 02:30	1

Client Sample ID: OC-GW-34SR-XXX

Lab Sample ID: 480-38147-3

Date Collected: 05/09/13 11:05

Matrix: Ground Water

Date Received: 05/11/13 06:00

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	1.9	J	5.0	1.0	ug/L		05/13/13 07:45	05/13/13 19:13	1
Aluminum	ND		200	60	ug/L		05/13/13 07:45	05/13/13 19:13	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2.2		0.50	0.28	mg/L			05/14/13 17:24	1
Sulfate	7.8		2.0	0.35	mg/L			05/14/13 17:24	1
Ammonia	0.15		0.020	0.0090	mg/L			05/13/13 17:03	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	64		1.0	1.0	umhos/cm			05/16/13 02:30	1

TestAmerica Buffalo

Client Sample Results

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater Semi-annual

TestAmerica Job ID: 480-38147-1

Client Sample ID: OC-GW-43SR-XXX

Lab Sample ID: 480-38147-4

Date Collected: 05/09/13 09:20

Matrix: Ground Water

Date Received: 05/11/13 06:00

Method: 6010 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	1.6	J	5.0	1.0	ug/L		05/13/13 07:45	05/13/13 19:15	1
Aluminum	350		200	60	ug/L		05/13/13 07:45	05/13/13 19:15	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	270		2.5	1.4	mg/L			05/15/13 17:01	5
Sulfate	34		2.0	0.35	mg/L			05/14/13 17:55	1
Ammonia	1.8		0.020	0.0090	mg/L			05/13/13 17:04	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	990		1.0	1.0	umhos/cm			05/16/13 02:30	1

QC Sample Results

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater Semi-annual

TestAmerica Job ID: 480-38147-1

Method: 6010 - Metals (ICP)

Lab Sample ID: MB 480-117609/29-B

Matrix: Water

Analysis Batch: 118442

Client Sample ID: Method Blank

Prep Type: Dissolved

Prep Batch: 118122

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		5.0	1.0	ug/L		05/13/13 07:45	05/13/13 18:48	1
Aluminum	ND		200	60	ug/L		05/13/13 07:45	05/13/13 18:48	1

Lab Sample ID: LCS 480-117609/30-B

Matrix: Water

Analysis Batch: 118442

Client Sample ID: Lab Control Sample

Prep Type: Dissolved

Prep Batch: 118122

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	200	198		ug/L		99	80 - 120
Aluminum	10000	9920		ug/L		99	80 - 120

Lab Sample ID: LCSD 480-117609/26-B

Matrix: Water

Analysis Batch: 118442

Client Sample ID: Lab Control Sample Dup

Prep Type: Dissolved

Prep Batch: 118122

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium	200	199		ug/L		99	80 - 120	0	20
Aluminum	10000	9800		ug/L		98	80 - 120	1	20

Lab Sample ID: 480-38147-2 MS

Matrix: Ground Water

Analysis Batch: 118442

Client Sample ID: OC-GW-34D-XXX

Prep Type: Dissolved

Prep Batch: 118122

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	12		200	212		ug/L		100	75 - 125
Aluminum	ND		10000	9860		ug/L		98	75 - 125

Lab Sample ID: 480-38147-2 MSD

Matrix: Ground Water

Analysis Batch: 118442

Client Sample ID: OC-GW-34D-XXX

Prep Type: Dissolved

Prep Batch: 118122

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium	12		200	206		ug/L		97	75 - 125	3	20
Aluminum	ND		10000	9550		ug/L		95	75 - 125	3	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 480-118283/100

Matrix: Water

Analysis Batch: 118283

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			05/14/13 16:03	1
Sulfate	ND		2.0	0.35	mg/L			05/14/13 16:03	1

TestAmerica Buffalo

QC Sample Results

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater Semi-annual

TestAmerica Job ID: 480-38147-1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 480-118283/99

Matrix: Water

Analysis Batch: 118283

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	19.5		mg/L		97	90 - 110
Sulfate	20.0	19.6		mg/L		98	90 - 110

Lab Sample ID: 480-38147-2 MS

Matrix: Ground Water

Analysis Batch: 118283

Client Sample ID: OC-GW-34D-XXX

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	12		25.0	36.0		mg/L		95	90 - 110
Sulfate	35		25.0	57.9		mg/L		93	90 - 110

Lab Sample ID: 480-38147-2 MSD

Matrix: Ground Water

Analysis Batch: 118283

Client Sample ID: OC-GW-34D-XXX

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	12		25.0	36.1		mg/L		96	90 - 110	0	20
Sulfate	35		25.0	58.0		mg/L		94	90 - 110	0	20

Lab Sample ID: MB 480-118750/4

Matrix: Water

Analysis Batch: 118750

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.28	mg/L			05/15/13 14:29	1
Sulfate	ND		2.0	0.35	mg/L			05/15/13 14:29	1

Lab Sample ID: LCS 480-118750/3

Matrix: Water

Analysis Batch: 118750

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	19.9		mg/L		99	90 - 110
Sulfate	20.0	20.9		mg/L		105	90 - 110

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 480-118347/174

Matrix: Water

Analysis Batch: 118347

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.020	0.0090	mg/L			05/13/13 18:25	1

TestAmerica Buffalo

QC Sample Results

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater Semi-annual

TestAmerica Job ID: 480-38147-1

Method: 350.1 - Nitrogen, Ammonia (Continued)

Lab Sample ID: MB 480-118347/99

Matrix: Water

Analysis Batch: 118347

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.020	0.0090	mg/L			05/13/13 16:58	1

Lab Sample ID: LCS 480-118347/100

Matrix: Water

Analysis Batch: 118347

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	0.986		mg/L		99	90 - 110

Lab Sample ID: LCS 480-118347/175

Matrix: Water

Analysis Batch: 118347

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	0.975		mg/L		97	90 - 110

Lab Sample ID: 480-38147-2 MS

Matrix: Ground Water

Analysis Batch: 118347

Client Sample ID: OC-GW-34D-XXX

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	14		2.00	15.8	4	mg/L		92	54 - 150

Lab Sample ID: 480-38147-2 MSD

Matrix: Ground Water

Analysis Batch: 118347

Client Sample ID: OC-GW-34D-XXX

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ammonia	14		2.00	15.4	4	mg/L		69	54 - 150	3	20

QC Association Summary

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater Semi-annual

TestAmerica Job ID: 480-38147-1

Metals

Prep Batch: 118122

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-38147-1	OC-MP-2PORT13-XXX	Dissolved	Water	3005A	
480-38147-2	OC-GW-34D-XXX	Dissolved	Ground Water	3005A	
480-38147-2 MS	OC-GW-34D-XXX	Dissolved	Ground Water	3005A	
480-38147-2 MSD	OC-GW-34D-XXX	Dissolved	Ground Water	3005A	
480-38147-3	OC-GW-34SR-XXX	Dissolved	Ground Water	3005A	
480-38147-4	OC-GW-43SR-XXX	Dissolved	Ground Water	3005A	
LCS 480-117609/30-B	Lab Control Sample	Dissolved	Water	3005A	
LCSD 480-117609/26-B	Lab Control Sample Dup	Dissolved	Water	3005A	
MB 480-117609/29-B	Method Blank	Dissolved	Water	3005A	

Analysis Batch: 118442

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-38147-1	OC-MP-2PORT13-XXX	Dissolved	Water	6010	118122
480-38147-2	OC-GW-34D-XXX	Dissolved	Ground Water	6010	118122
480-38147-2 MS	OC-GW-34D-XXX	Dissolved	Ground Water	6010	118122
480-38147-2 MSD	OC-GW-34D-XXX	Dissolved	Ground Water	6010	118122
480-38147-3	OC-GW-34SR-XXX	Dissolved	Ground Water	6010	118122
480-38147-4	OC-GW-43SR-XXX	Dissolved	Ground Water	6010	118122
LCS 480-117609/30-B	Lab Control Sample	Dissolved	Water	6010	118122
LCSD 480-117609/26-B	Lab Control Sample Dup	Dissolved	Water	6010	118122
MB 480-117609/29-B	Method Blank	Dissolved	Water	6010	118122

General Chemistry

Analysis Batch: 118283

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-38147-1	OC-MP-2PORT13-XXX	Total/NA	Water	300.0	
480-38147-2	OC-GW-34D-XXX	Total/NA	Ground Water	300.0	
480-38147-2 MS	OC-GW-34D-XXX	Total/NA	Ground Water	300.0	
480-38147-2 MSD	OC-GW-34D-XXX	Total/NA	Ground Water	300.0	
480-38147-3	OC-GW-34SR-XXX	Total/NA	Ground Water	300.0	
480-38147-4	OC-GW-43SR-XXX	Total/NA	Ground Water	300.0	
LCS 480-118283/99	Lab Control Sample	Total/NA	Water	300.0	
MB 480-118283/100	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 118347

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-38147-1	OC-MP-2PORT13-XXX	Total/NA	Water	350.1	
480-38147-2	OC-GW-34D-XXX	Total/NA	Ground Water	350.1	
480-38147-2 MS	OC-GW-34D-XXX	Total/NA	Ground Water	350.1	
480-38147-2 MSD	OC-GW-34D-XXX	Total/NA	Ground Water	350.1	
480-38147-3	OC-GW-34SR-XXX	Total/NA	Ground Water	350.1	
480-38147-4	OC-GW-43SR-XXX	Total/NA	Ground Water	350.1	
LCS 480-118347/100	Lab Control Sample	Total/NA	Water	350.1	
LCS 480-118347/175	Lab Control Sample	Total/NA	Water	350.1	
MB 480-118347/174	Method Blank	Total/NA	Water	350.1	
MB 480-118347/99	Method Blank	Total/NA	Water	350.1	

TestAmerica Buffalo

QC Association Summary

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater Semi-annual

TestAmerica Job ID: 480-38147-1

General Chemistry (Continued)

Analysis Batch: 118750

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-38147-4	OC-GW-43SR-XXX	Total/NA	Ground Water	300.0	
LCS 480-118750/3	Lab Control Sample	Total/NA	Water	300.0	
MB 480-118750/4	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 118897

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-38147-1	OC-MP-2PORT13-XXX	Total/NA	Water	SM 2510B	
480-38147-2	OC-GW-34D-XXX	Total/NA	Ground Water	SM 2510B	
480-38147-3	OC-GW-34SR-XXX	Total/NA	Ground Water	SM 2510B	
480-38147-4	OC-GW-43SR-XXX	Total/NA	Ground Water	SM 2510B	
LCS 480-118897/1	Lab Control Sample	Total/NA	Water	SM 2510B	
LCS 480-118897/23	Lab Control Sample	Total/NA	Water	SM 2510B	

Lab Chronicle

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater Semi-annual

TestAmerica Job ID: 480-38147-1

Client Sample ID: OC-MP-2PORT13-XXX

Date Collected: 05/09/13 10:10

Date Received: 05/11/13 06:00

Lab Sample ID: 480-38147-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			118122	05/13/13 07:45	SS	TAL BUF
Dissolved	Analysis	6010		1	118442	05/13/13 18:55	AH	TAL BUF
Total/NA	Analysis	300.0		1	118283	05/14/13 16:44	KC	TAL BUF
Total/NA	Analysis	350.1		1	118347	05/13/13 17:00	SB	TAL BUF
Total/NA	Analysis	SM 2510B		1	118897	05/16/13 02:30	LK	TAL BUF

Client Sample ID: OC-GW-34D-XXX

Date Collected: 05/09/13 12:20

Date Received: 05/11/13 06:00

Lab Sample ID: 480-38147-2

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			118122	05/13/13 07:45	SS	TAL BUF
Dissolved	Analysis	6010		1	118442	05/13/13 18:57	AH	TAL BUF
Total/NA	Analysis	300.0		1	118283	05/14/13 16:54	KC	TAL BUF
Total/NA	Analysis	350.1		10	118347	05/13/13 18:40	SB	TAL BUF
Total/NA	Analysis	SM 2510B		1	118897	05/16/13 02:30	LK	TAL BUF

Client Sample ID: OC-GW-34SR-XXX

Date Collected: 05/09/13 11:05

Date Received: 05/11/13 06:00

Lab Sample ID: 480-38147-3

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			118122	05/13/13 07:45	SS	TAL BUF
Dissolved	Analysis	6010		1	118442	05/13/13 19:13	AH	TAL BUF
Total/NA	Analysis	300.0		1	118283	05/14/13 17:24	KC	TAL BUF
Total/NA	Analysis	350.1		1	118347	05/13/13 17:03	SB	TAL BUF
Total/NA	Analysis	SM 2510B		1	118897	05/16/13 02:30	LK	TAL BUF

Client Sample ID: OC-GW-43SR-XXX

Date Collected: 05/09/13 09:20

Date Received: 05/11/13 06:00

Lab Sample ID: 480-38147-4

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			118122	05/13/13 07:45	SS	TAL BUF
Dissolved	Analysis	6010		1	118442	05/13/13 19:15	AH	TAL BUF
Total/NA	Analysis	300.0		1	118283	05/14/13 17:55	KC	TAL BUF
Total/NA	Analysis	350.1		1	118347	05/13/13 17:04	SB	TAL BUF
Total/NA	Analysis	300.0		5	118750	05/15/13 17:01	KAC	TAL BUF
Total/NA	Analysis	SM 2510B		1	118897	05/16/13 02:30	LK	TAL BUF

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TestAmerica Buffalo

Certification Summary

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater Semi-annual

TestAmerica Job ID: 480-38147-1

Laboratory: TestAmerica Buffalo

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0686	07-06-13
California	NELAP	9	1169CA	09-30-13
Connecticut	State Program	1	PH-0568	09-30-14
Florida	NELAP	4	E87672	06-30-13
Georgia	State Program	4	N/A	03-31-14
Georgia	State Program	4	956	06-30-13
Georgia	State Program	4	956	03-31-14
Illinois	NELAP	5	200003	09-30-13
Iowa	State Program	7	374	03-15-15
Kansas	NELAP	7	E-10187	01-31-14
Kentucky	State Program	4	90029	12-31-13
Kentucky (UST)	State Program	4	30	04-01-14
Louisiana	NELAP	6	02031	06-30-13
Maine	State Program	1	NY00044	12-04-13
Maryland	State Program	3	294	03-31-14
Massachusetts	State Program	1	M-NY044	06-30-13
Michigan	State Program	5	9937	04-01-13 *
Minnesota	NELAP	5	036-999-337	12-31-13
New Hampshire	NELAP	1	2973	09-11-13
New Hampshire	NELAP	1	2337	11-17-13
New Jersey	NELAP	2	NY455	06-30-13
New York	NELAP	2	10026	04-01-14
North Dakota	State Program	8	R-176	03-31-14
Oklahoma	State Program	6	9421	08-31-13
Oregon	NELAP	10	NY200003	06-09-13
Pennsylvania	NELAP	3	68-00281	07-31-13
Rhode Island	State Program	1	LAO00328	12-31-13
Tennessee	State Program	4	TN02970	04-01-14
Texas	NELAP	6	T104704412-11-2	07-31-13
USDA	Federal		P330-11-00386	11-22-14
Virginia	NELAP	3	460185	09-14-13
Washington	State Program	10	C784	02-10-14
West Virginia DEP	State Program	3	252	09-30-13
Wisconsin	State Program	5	998310390	08-31-13

* Expired certification is currently pending renewal and is considered valid.

TestAmerica Buffalo

Method Summary

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater Semi-annual

TestAmerica Job ID: 480-38147-1

Method	Method Description	Protocol	Laboratory
6010	Metals (ICP)	SW846	TAL BUF
300.0	Anions, Ion Chromatography	MCAWW	TAL BUF
350.1	Nitrogen, Ammonia	MCAWW	TAL BUF
SM 2510B	Conductivity, Specific Conductance	SM	TAL BUF

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Sample Summary

Client: Olin Corporation
Project/Site: Olin Chemical Groundwater Semi-annual

TestAmerica Job ID: 480-38147-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-38147-1	OC-MP-2PORT13-XXX	Water	05/09/13 10:10	05/11/13 06:00
480-38147-2	OC-GW-34D-XXX	Ground Water	05/09/13 12:20	05/11/13 06:00
480-38147-3	OC-GW-34SR-XXX	Ground Water	05/09/13 11:05	05/11/13 06:00
480-38147-4	OC-GW-43SR-XXX	Ground Water	05/09/13 09:20	05/11/13 06:00

Login Sample Receipt Checklist

Client: Olin Corporation

Job Number: 480-38147-1

Login Number: 38147

List Source: TestAmerica Buffalo

List Number: 1

Creator: Kolb, Chris M

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	N/A	

Chain of Custody Record

Client Information Client Contact: Mr. James Cashwell Company: Olin Corporation Address: PO BOX 248 City: Charleston State, Zip: TN, 37310-0248 Phone: REVI0020 Email: jmcashwell@olin.com Project Name: Groundwater Quarterly Event Desc: Groundwater Quarterly (2, 5, 10) Site: Massachusetts		Sampler: David Chapman Lab PM: Mason, Becky C Phone: 339-927-3793 E-Mail: becky.mason@testamericainc.com		Carrier Tracking No(s): COC No. 480-35755-8566.1 Page: 1 of 1 Job #:	
Due Date Requested: Standard TAT Requested (days): Standard		Analysis Requested			
PO #: REVI0020 WO #:		Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 M - Hexane N - None O - AsNaO2 P - Na2O4S F - NaHSO4			
Sample Identification Sample Date Sample Time Sample Type (C=Comp, G=grab) Matrix (W=water, S=solid, O=oil, BT=Tissue, A=Air) Field Filtered Sample (Yes or No) Perform MS/MSD (Yes or No) 300.0_28D - (MOD) Local Method 350.1 - Ammonia 6010MCP - (MOD) 6010 MCP Custom analyte list 2510B - Specific Conductance		Total Number Special Instructions/Note: Note: Dispersed metals = Al, Co no MS/MSD perform MS/MSD perform MS/MSD			
Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months			
Deliverable Requested: I, II, III, IV, Other (specify)		Special Instructions/QC Requirements:			
Empty Kit Relinquished by:		Date:			
Relinquished by: David Chapman / [Signature] Relinquished by: [Signature] Relinquished by:		Date/Time: 5-10-13 12:00 Date/Time: 5/10/13 1630 Date/Time:			
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Cooler Temperature(s) °C and Other Remarks: 5.0 FCEH			